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EDITORIAL

WHY IS IT that all the parts of the human body function in a coordinated, finely-tuned way? Why is it that when one part suffers, every other part suffers with it? Most biologists and educationalists will offer a Darwinian answer:

> "Our body parts are moulded by natural selection acting on natural variations. These forces are undirected and unsupervised, and the outcome of the evolutionary process was uncertain. Our bodies are ultimately accidents of history."

By contrast, the Apostle Paul taught that 'in fact God has arranged the parts in the body, every one of them, just as he wanted them to be' (1 Corinthians 12:18). We are what we are by God's design. Our bodies are not accidents of history.

Any proposed explanation of the makeup of our bodies that omits the will of God, and his purposeful ordering of the parts, must be inadequate. The consequence we need to consider is that design issues cannot be relegated to a 'faith' compartment that has no links with reason, knowledge or science. A Christian view of science must address issues of design in nature – which, of course, go far wider than the human body. As Christians we hold to the integration of all knowledge under God, and this means that it is appropriate for science to operate within a framework of revealed truth.

Sad to say, many contemporary scientists and educators are extremely hostile to the thought that science can be integrated with any other source of knowledge. For them, science is the only route to knowledge, and all other truth claims are fraudulent and must be firmly resisted. Christians can easily find ourselves caught up in controversy, because design, purpose and God's sovereign control is an integral part of our thinking. Evolutionists will have none of this!

> "Biology is the study of complicated things that give the appearance of having been designed for a purpose." (Richard Dawkins, The Blind Watchmaker, 1986, Penguin Books, p.1).
>
> "Man is the result of a purposeless and natural process that did not have him in mind." (George Gaylord Simpson, The Meaning of Evolution, Yale University Press, 1967, p. 345):

This hostility was revealed in December 2002 in public comments by one of Bristol's Education chiefs about Noah's Ark Zoo Park at Wraxhall. Anthony Bush has been developing this educational attraction over several years and it achieved zoo-status last year. Thousands of young people (and many adults too) have benefited from the unique way visitors are introduced to God's creation and to the biblical account of Noah and the Ark. *Origins* readers were introduced to Anthony in issue 31, which included a poem written by him.

North Somerset Council's executive member for learning said: 'The exhibits appear to have no scientific basis and I'd personally feel concerned about young students being exposed to this.' He also said: 'Both the director of education and I are very concerned about this'. The references are particularly to the Noah's Ark heritage exhibition. It has a 14 ft model of the Ark and 15 exhibits addressing issues drawn from history, biology, geology, astronomy, archaeology. The publicity material challenges visitors to think about this material, most of which they are unlikely to have met before. 'A young Earth? See and test the evidence.'

The reaction of the education chiefs is actually highly predictable. We live in days when evolutionary explanations are almost unquestioned. Few will acknowledge that there is any evidence against the theory or any controversy for students to weigh. Any talk of 'testing the evidence' is interpreted as an excuse for perpetuating crazy, unscientific ideas. The 'politically correct' response is to say that there is no scientific merit in the arguments and students, and especially children, need protecting from fundamentalist bigots.

Our task is to develop a Christian response. Our first priority is to pray. The situation is all the more grave because Christians are divided on these issues. People like Anthony Bush need our prayers. Christians need to know what the Bible teaches on origins and the place of these truths within the totality of God's revelation. We commend again the *Creation Manifesto* to readers of *Origins* (further details are on the BCS web site). We need also to be people who know how to test the evidence for our own benefit and so that we can help others. This is a major objective of this journal, and it is the prayer of the editors that you will find the articles, news items and reviews edifying and a stimulus to further thought. □

FOR FURTHER INFORMATION ON THE WORLDWIDE WEB:

http://www.noahsarkfarmcentre.co.uk/

http://www.epost.co.uk (and search for Noah).

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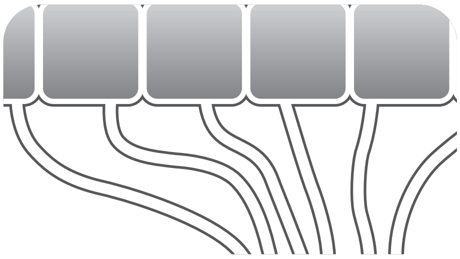

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›THE MAN WHO SHAPED SCIENCE.

BUT TOOK IT "OUT OF THE FRYING PAN INTO THE FIRE"

DAVID J. TYLER

ANYONE SEEKING TO LEARN about the rise of science in Europe soon finds out that a key figure was Francis Bacon. He was extraordinarily influential and, even today, people refer to "Baconian science" and "Baconian principles". Many Christians regard Bacon as a role model. Forster and Marston (1999) provide many examples of this after commenting: "One could hardly exaggerate the standing and influence of Bacon, both on Western science and on the thinking of Bible-believing Christians in their attitude to it" (p.322). Later, they write:

> "We would, then, defend the classical Baconian approach to science-faith issues, which was rooted in earlier Christian ideas and has shaped the whole of Christian and scientific thinking on relationships of science and theology" (p.400). The aim of this article is to assess the wisdom of this approach.

Francis Bacon (1561-1626) was not a scientist himself. His main contribution was to guide other scholars away from an undue veneration of Greek philosophers and to set out an alternative methodology for gaining knowledge from the natural world. According to Hooykaas (1972), "he was perfectly conscious of the semi-pagan character of the old science."

Bacon saw very clearly that the intellectual framework provided by the Greeks was a terrible straitjacket for scholars (the "frying pan" in the sub-title). Something drastic had to be done if there was to be any real advance in understanding the natural world. He was passionate about the reformation of learning and used very strong words to promote his ideas. His wisdom, his personality and his social standing combined to make him an influential thinker. He was regarded very highly by the founders of the Royal Society, most of whom were younger men. They found his writings very helpful in the development of their own thinking. Robert Boyle (1690), for example, called him "one of the first and greatest experimental philosophers of our age."

SOME POSITIVE CONTRIBUTIONS OF BACON

1. The reformation of learning

Seventeenth Century scholars desperately needed a fresh approach to the challenge of gaining knowledge about the natural world. At that time, religious teachers, who were not distinguished by their understanding of nature, provided the intellectual leadership. Many of them were still fighting a rearguard action against Copernicus and Galileo, who had challenged the geocentric views of their peers. These leaders drew inspiration from Thomas Aquinas, who had found a way to make the philosophy of Aristotle coexist with theology (Tyler, 1997). In Bacon's eyes, the situation was entrenched and healthy "learning" was stifled. Only by challenging the Aristotelian approach to knowledge could there be progress in studying the natural world. This is what Bacon provided.

The universities of the time were still dominated by Aristotelian philosophy, but Bacon wanted to see this discarded as obsolete and erroneous. God is not under any logical necessity to order his creation according to a particular philosophical system – no matter how logical it may appear at the time. Rather, science leads us to partial knowledge, and we grow in understanding. Crucial to science is detailed and methodical experimentation: a fundamental element of Bacon's approach (Hesse, 1964). Jones (1961) explained that "he forcefully called men's attention back to the physical world, made them distrust the sheer operations of the mind divorced from material reality, and taught them the value and necessity of serious observation of nature as a *sine qua non* of scientific knowledge."

Hooykaas (1972) is positive about this aspect of Bacon's thinking:

> "The analogy between the two books (Scripture and Nature) irresistibly presented itself here. Christian religion claimed to be based on 'historical' (real) phenomena, observed by the believer or known from reliable witnesses. Science, the interpretation of the book of creatures, is also founded on phenomena. Bacon thought that man could never search too far either in the book of God's word or in the book of God's works, in divinity or in science. As the School philosophers, in his opinion, had proudly substituted their own inventions for 'the oracle of God's word', 'so, in the inquisition of nature, they even left the oracle of God's works' and adored the deformed images of their own minds or a few received authors." (p.49)

God has revealed himself in nature. This is a biblical truth (Psalm 19:1-3, Romans 1:19-20). Bacon wanted to work out the implications of this for scholars seeking to read and understand God's Book of nature. Later in this article, we consider whether he succeeded.

Bacon composed "A Confession of Faith" early in the 17th Century, although it was 1641 when first published. He reveals himself to be a Christian, standing in the confessional tradition of the Reformed churches. He affirmed the biblical history of origins. He held to a supernatural creation in 6 days, and the subsequent preservation of creation by God's providence. The laws of nature were nothing less than God's "laws of the creation".

However, the heirs of Baconianism have not made this clear distinction between the way God created and the way he upholds his creation. Consequently, a tension has been created between Baconian tradition and biblically-based science.

2. A recognition of the deficiencies within the scholar

A philosophy built on maths or logic creates an appearance of objectivity. However, Aristotelianism provides a good case study showing that this may be an illusion. For example, the logic which declared that planets must move in circular orbits around the Earth was wrong, however compelling it seemed at the time. The knower (the scholar) is fallible, and the knower's deficiencies need to be addressed.

Bacon recognised:

(a) defects of the senses – for which the use of well-designed experiments was prescribed to check the data gathered;

(b) defects of understanding – for which Bacon advocated an "attitude" which would avoid the extremes of dogmatism and scepticism, and would focus in on the truth. He identified numerous "idols" that affect our minds and which distort the judgments of scholars (Novum Organum I, xxxviii-lxviii).

The recognition of personal fallibility was not unrelated to the Christian culture of the time. This emphasis distanced Bacon sharply from the Aristotelian tradition, which allowed autonomy in the realm of natural philosophy and had little place for humility.

To address the problem of deficiencies, Bacon recognised the need to look for negative evidences, or refuting experiments, to give weight to all positive statements of science (Hesse, 1964). In this, he anticipated the "falsification" approach of Popper in the 20TH Century.

3. Goals for scientific work

Bacon suggested two reasons to justify scientific work: "the glory of the Creator and the relief of man's estate". The "glory of the Creator" was not developed in any significant way by Bacon – the main idea seemed to be associated with discoveries of the Creator's ingenuity. The relief of man's estate was a much stronger emphasis and the utility of science became a signature of Baconianism. Science was not an end in itself but a means to benefit one's fellows. This was a new form of philanthropism.

These emphases contribute to a portrait of Bacon's "man of science". Bacon himself developed (in his only fictional work: The New Atlantis) the concept of scientific priests in the role of leadership on the island of Bensalem. The scientists formed an elite community that engaged in the worship of God by their labours and the "turning of them into good and holy uses". This romantic vision provided inspiration for the Founders of the Royal Society and influenced the way scientific work developed in many European countries.

BACON'S VIEW OF DIVINE PROVIDENCE

Calvin's teaching on providence invoked the immediate activity of God, but many others found a tension in their thinking. They wanted to make a major difference between primary and secondary causes, with God's immediate activity reserved for primary causes. Bacon's emphasis was that God gave to his creation "constant and everlasting laws" and he felt that talk of God's immediate control over his creation was somehow inimical to the study of nature.

> "Bacon projected a new view of nature which allowed both the full operation of second causes and the full dependence of all things on God. In this new order there would be no gaps in natural explanation, so God would have to be seen to function immediately in the whole of nature or else not at all. Bacon's hope was that the new science would not displace God's providential activity the way Aristotelian science had done. Unfortunately, this was not to be the case, at least, not in the long run". (Kaiser, 1991, p.138).

Here, then, are the beginnings of significant problems with Baconian thinking. He recognised the place of miracles (involving primary causes) when considering origins and redemptive history. However, this was lost sight of in the discussion of the methodology of science. Furthermore, Bacon's view of secondary causation was hard to distinguish from the position that became known as Deism (God created all things by fiat and then allowed it to function without further need for him to be involved).

> "A commitment to materialism was another basic feature of his philosophy. He pictured reality in its ultimate character as body or matter, and also expressed a strong attraction to atomism in his earlier writings" (p.36, Zagorin, 1998).

By making God adhere strictly to secondary causes (reducing the emphasis on God's immediate control over his creation) in his providential government, Bacon opened the door for a view of creation as autonomous and able to exist in its own right. In the minds of those who developed these views, God was either the being conceived of by Deists or he was not needed at all!

ASSESSMENT OF BACONIAN PRINCIPLES FOR SCIENTIFIC ACTIVITY

The question now is: What is the relationship between Bacon's sketch of a "Man of Science" and the principles by which Christians are to be involved in science? In other words: does Bacon's "Man of Science" think and behave like a Christian?

Bacon's confession of faith is robustly Christian, he worked with Puritan colleagues and his mother was known as a Puritan. However, he did not justify his "Man of Science" using Christian arguments. He secularised everything. Prior (1954) comments:

> "Bacon separated completely the realms of religion and of natural knowledge in the interest of establishing a science free of

> superstition and presumably a religion free of sophistry. The basis of religion was for him the knowledge of God's will and law, matters which lay beyond man and hence were knowable only through divine revelation. Bacon urged therefore "that we do not presume by the contemplation of nature to attain to the mysteries of God", that the pursuit of natural knowledge be kept clear of religion, and that men "do not unwisely mingle or confound these learnings together".

Bacon's Confession of Faith shows that he did accept that "the book of God's word" gives us real knowledge about the origins of the natural world. However, "it is equally evident that his mind was overwhelmingly secular in its interests" (p.51, Zagorin, 1998). Furthermore, his testimony is weakened by the involvement that Bacon had with Rosicrucianism and Freemasonry. Other agendas were operating in Bacon's life.

Nevertheless, even if we allow his confession to be taken at face value, it must be said that his lead was not followed by later Baconians. Their compartmentalisation of knowledge became the same, in essence, as the double revelation approach adopted by Aquinas and Galileo (Tyler, 1997).

Bacon's approach to knowledge had an enormous impact on the scientific community. His ideas were discussed widely – although the positions were somewhat polarised. On the one side were the traditionalists (Aristotelians) and on the other the new generation of scientists (who were still developing a consensus on experimentation and Natural Philosophy). The stakes were high, and it is not surprising that people rallied round one or other position.

The Natural Philosophers failed to see that their radical separation of the two books was not a truth drawn from the pages of Scripture. Rather, it was a philosophical contrivance that united them with their opponents! Both parties were adopting the same compartmentalisation of knowledge that had been developed by Aquinas. The effect was to promote science as an autonomous sphere of knowledge and to insulate science from effective "external" evaluation. It reinforced the myth that science is objective, value-free and the pathway to truth.

It has already been noted that one of Bacon's contributions was to bring out in to the open the fallibility of the scholar. He recognised that man is his own worst enemy – and that if science is to prosper, these human deficiencies must be addressed. Here, it might be thought, was an opportunity for Christian thinking to be applied to the problem. However, here too, Bacon turned in another direction and sought answers from his secular perspective. He developed the concept of the scientist as a priest/king. The traveller in New Atlantis witnesses a visit of one of the Fathers of Solomon's House. His arrival is heralded; he is attired in splendour and carried in a chariot as a dignitary. Prior (1954) continues the story:

> "His behaviour suggests the high priest: "He held up his bare hand as he went, as blessing the people, but in silence" ... In Bensalem the scientists are a consecrated priesthood, and it seems less correct to say of them that they were religious men than that they constituted a religious cult in themselves ... "

This presentation of the status of scientists had partly a social rationale (to attract young people to science) but it was also to sustain the religious dimension he had abstracted from Christianity and an attempt to make science the new "establishment". The "Community of Scientists" was actually an elite – taking over from the old elite! There is no democracy here! This theme was to be developed with a vengeance by Thomas Huxley in the 19th Century.

Bacon has his scientists professing allegiance to God. However, we must say the same of these scientists as we also say of the ritual of the Freemasons: unless these people bow their minds to God, drawing knowledge from him to guide their conduct and thoughts, their words are only the chantings of a cult. There is a real danger of professing to serve God but choosing to live according to their own wisdom.

The tension is also to be seen in possible abuses of science. What if science is not used for the "relief of man's estate"? How is this situation to be handled? Undoubtedly, the Scriptures have guidance on these matters, but Bacon does not refer to them.

> "Bacon's failure to confront this important question with his customary resoluteness and realism suggests the real measure of his fear. It was only in the utopian setting of New Atlantis that he faced the issue squarely and carried the implications of his fears to their logical conclusion: "And this we do also. We have consultations, which of the inventions and experiences which we have discovered shall be published, and which not: and take all an oath of secrecy, for the concealing of those which we think fit to keep secret: though some of those we do reveal sometimes to the state and some not." (Prior, 1954)

This brief passage says, in effect, that just as in the interests of mankind scientists must constitute themselves an international freemasonry or priesthood, in the same interest they must set themselves above the interests of the state.

Bacon added to the separation of science from religion, for he wanted also to see the separation of science from politics. One view of this emphasis is that Bacon was naïve. Scientists have not always been gentlemen of independent means – as they were in Bacon's day. The world of science has generally found itself not only subject to the state, but also subservient to the policies of employers. Ethical challenges come to all people – scientists included. Examples of compromise are not difficult to find: scientists worked on some very nasty projects for Hitler and other despots. There always seem to be some scientists who are prepared to participate in research that results in human or environmental exploitation. Rarely do scientific institutions agree on ethical principles affecting their members.

Another view of the Baconian "divide" is that he had political objectives. Elitism was very strong in his day, and Bacon was making a "bid" for scientists to be the "wise" leaders of society, to whom all others would listen and respond. The quest for power is a very human characteristic, and numerous examples can be found of prominent scientists taking up this elitist agenda. By contrast, the Christian way is to affirm the Lordship of Christ and the servant role of community leaders.

CONCLUDING COMMENTS

The picture developed in this article is one of contrasts. Bacon is a very human character, with great strengths and even greater weaknesses. It is not difficult to either love him or hate him – depending on where you choose to look!

Many of Bacon's weaknesses can be linked to the love of this world: the desire for influence and status. This trait appears to be a significant factor in both his rise to prominence and his downfall from political power. His vision of an elite scientific priesthood appears to have been stimulated by these motives.

His wisdom is displayed in the way he identifies idols of the mind (still prized reading for many today). His folly is manifest in not warning scholars about the idolatry of operating independently of God and in his expectation that a group of scientists can achieve freedom from idolatry.

His methodology of induction helped people to make the break with Greek philosophy and to adopt experimentation. However, today it is regarded as somewhat naïve. This is not how scientists actually operate. They bring a cultural background, personal background and personal intuition to their work. Science is not an exercise in rational analysis, independent of those undertaking the work. There is not an option of starting with a blank sheet and entering systematically the results of experiments.

Bacon was willing to challenge Aristotelianism, but he somehow failed to see the deeper problem of compartmentalisation introduced by Aquinas. The strict separation of God's revelation in nature and God's revelation in the Scriptures has been a disaster for the development of a Christian mind. It has completely obliterated the role of Scripture to inform us about origins, despite the fact that Bacon himself recognised this as a proper application of biblical truth. Compartmentalisation has led also to science being developed in an autonomous way, without any recognition of the foundational principles of science being drawn from revelation. Science is now dominated by naturalistic philosophy, and theology is excluded from dealing with "knowledge" in any objective sense. As a consequence, contemporary science has no philosophical basis to support the basic axioms on which it operates (Trigg, 2001).

Baconian science influenced the early intellectual leaders in the Earth Sciences. They pursued their discipline without reference to biblical truth – because they regarded themselves as studying the book of nature, and everyone accepted that this should not be confounded with the book of revealed truth. That old earth ideas were so prominent when geological science was developed has little to do with the geologic data, and much to do with the Baconian mindset they had adopted. Further comments on this are in Tyler (1995).

Despite all these comments, we should honour the man for his strengths and learn from his weaknesses. He was a great man, and a mark of greatness is being willing to learn from the past and to change where appropriate. Persisting with the Baconian tradition is not acceptable for Christians today. We must develop something more robust and comprehensive – whilst retaining Bacon's contributions that stimulated and underpinned the emergence of modern science. We are with Bacon in wanting science to get out of the frying pan of deductive philosophy, but we do not want to see it consumed by the fire of naturalism. □

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LINKS TO WEB RESOURCES ON FRANCIS BACON:

http://www.luminarium.org/sevenlit/bacon/

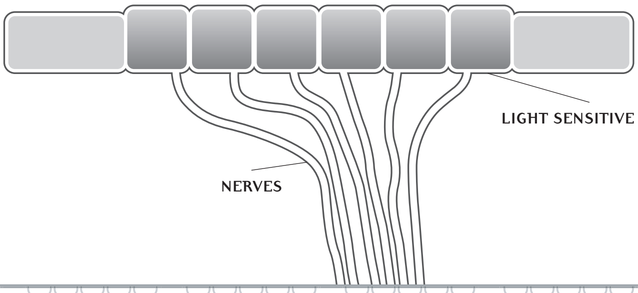
›A HOLE IN THE EYE.

MARC SURTEES

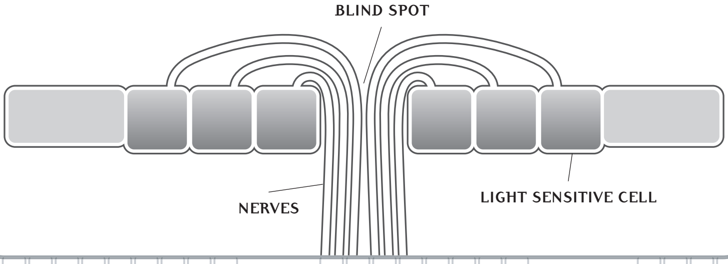
IT HAS BEEN SUGGESTED THAT DARWIN'S theory has been falsified because it cannot explain how complex structures such as the vertebrate eye could have evolved.

Evolutionists have responded to such challenges by arguing that all they need to do is show that it is at least possible that the eye could have evolved by a long series of very small changes each of which would have been advantageous. At the same time they say that we have to show that it was not possible, which is much more difficult.

›FIGURE 1. A DIAGRAM OF AN EYESPOT



›FIGURE 2. A DIAGRAM SHOWING THE WIRING OF A MAMMALIAN EYE



Darwinian evolution of the eye

Evolutionists have presented models of the evolution of the eye which seek to demonstrate that gradual evolution of the eye is possible starting from a simple eyespot made up of a few light sensitive cells (Nilssen and Pelger, 1994). This, we are told, together with the existence of some of the expected intermediate forms, is adequate proof that the eye has evolved through the process of adaptive evolution proceeding by many small, gradual changes.

Evolutionists have also suggested that there are features of the vertebrate eye that are only consistent with the theory of evolution. The nerve from each light sensitive cell (the rods and cones) leaves from the 'top' of the cells and light has to pass through them to reach the light sensitive cells. The nerves all pass through the retina at the blind spot. We are told that these two features make the vertebrate eye inefficient and therefore not what we should expect from something that has been designed. They also suggest that this backwards wiring of the vertebrate eye is exactly what would be expected from evolution in that it is good enough for the job.

Design

However, careful consideration of the design of the invertebrate eye and the vertebrate eye actually shows that the Darwinian explanation is impossible.

Firstly, as has been pointed out, all the models of gradual evolution of the eye ignore the origin of the first light sensitive cell. As Behe has pointed out a light sensitive cell is irreducibly complex (Behe, 1996). They also avoid the problem of the origin of the nerve to transmit the electrical signals, not to mention the issue of the processing the information coming from the eye. For example, the processing of the signals travelling from the eye is extremely complex and involves intermediate processing even before they reach the visual cortex of the brain. All that these models show is that it is possible to produce a collection of the parts of the eye by a series of gradual changes. They make no attempt to show how the controlling mechanisms, such as those required for focusing and adaptation to varying light intensity, could arise.

It is also worth noticing that it remains to be shown that the vertebrate eye is less efficient. Indeed it has been suggested that the network of blood vessels and nerves could act as a filter that is necessary for the optimal performance of the vertebrate eye.

However there is a more serious problem with these models of the supposed evolution of the eye. They all start with the nerves coming out of the back of an eyespot (see *Figure 1*). This is consistent with the evidence because no organisms with eye spots have the nerves outside the body and entering the body by passing through the eyespot. Indeed from an evolutionary perspective this is necessary as the vertebrate wiring is more complex (shown diagramatically in *Figure 2*).

But above all they ignore the step from wiring as shown in Figure 1 to the so-called backward wiring (*Figure 2*) that is seen in the vertebrate eye.

Furthermore, if the system is imperfect, as evolutionists like to point out, how did the system change from that which is better to that which is less good? According to the Darwinian rules this step involves a reduction in fitness not to mention the extra cost of producing a more complex system. This is not what we would expect from Darwinian evolution.

Conclusion

It has already been noted that the major weakness of the models of the evolution of the eye is that they do not show how a light sensitive cell could arise. They are also unable to account for the transition from the wiring layout seen in the invertebrate eye to the more complex wiring seen in vertebrate eyes. If the evolutionary process is true then the whole system of light sensitive cells, nerves and blood vessels would have had to flip over and a hole would have to appear for the nerves to pass through to the brain. This is not a gradual process like those proposed by evolutionists. Furthermore, if evolutionists argue that the vertebrate eye is less efficient, then they need to propose a mechanism for the selection of a characteristic that reduces fitness at greater biological cost. Therefore, it seems that evolutionists are still unable to provide an explanation for the origin of the vertebrate eye. Biologists are left with the only viable alternative, which is purposeful design by the creator God. ▢

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›WARFIELD AND EVOLUTION.

J. H. JOHN PEET

BENJAMIN WARFIELD was a leading evangelical scholar and staunch exponent of the inerrancy of Scripture a century ago. His writings are still much appreciated by conservative evangelical scholars. He has often been quoted by Christian evolutionists as an example of a conservative evangelical who accepted evolution. Creationists have taken the claim at face value and been a little embarrassed by the admission. A recent article in *Evangelicals Now* (August 2002, page 13) by John Kilpatrick has gone back to sources to check the facts. In turn he has drawn on the works of David N Livingstone.

Kilpatrick draws attention to the fact that Warfield and his predecessor at Princeton, Charles Hodge, were contemporaries of Charles Darwin and not armed with all the scientific arguments we have today, but they did not give ground to the theory. Hodge accepted the Genesis account as fitting the known facts and attacked evolution theory primarily for its atheism. Darwin denied God's design as the controlling element of nature, though others extended the theory into atheism. (It seems strange to us that, even today, Christian evolutionists side with the atheists against the intelligent design movement). Warfield and Hodge also denied the large ages assigned to the universe by Darwinists.

Because evolution was still a theory in its early stages, they treated it as a probationary theory but emphasised that God works through natural laws and by miracle. It seems that part of their practical problem was the imprecision of the theory in such areas as the nature of a species and so it was unclear where there was conflict with Scripture. Nowadays, creationists generally accept that there is variation at the species level and even in genera, so that the Genesis kind is probably best related to the family level among the animals.

Warfield describes different approaches to the origin of the human body (though is adamant that God created the individual soul) and so has been misunderstood as to his allegiance to evolution against creation. Kilpatrick points out that Warfield insists on immediate creation, that is, directly by the action of God and not on pre-existing life forms. He is convinced about the creation of Adam and through him of all the people groups of the world. He insists that Eve could only have come about by a miracle. He accepted that the material universe was created ex nihilo.

That Warfield was more interested in the Why? of creation than the How? should not be held against him. It is time to reinstate Warfield into the "creationist" fold. ▢

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›DATING THE EARTH AND ACCIDENTS OF GEOCHEMISTRY.

DAVID J. TYLER

THE FIRST RADIOMETRIC DATES for the Earth's rocks were obtained during the period 1905-1910. During 1911, Arthur Holmes embarked on a research project as an honours student in the Royal College of Science in London. The topic was concerned with radiometric dating, and it proved to be a career interest with him right up to his death in 1965. As part of this research, Holmes produced the first geological timescale, based on a Uranium/Lead method of dating. The results are as follows:

TABLE 1: GEOLOGICAL TIME AND HOLMES' 1911 DATES

Assigned Geological Period	Holmes' U/Pb age (Ma)	Age range accepted today (Ma)
Carboniferous	340	362–330
Devonian	370	380–362
Silurian or Ordovician	430	443–418
Precambrian	various: 1025-1640	900–2500

Notes: U/Pb = Uranium/Lead, Ma = Million years

> "ALL THE KING'S HORSES AND ALL THE KING'S MEN, COULD NOT PUT HUMPTY TOGETHER AGAIN."
>
> HUMPTY IS THE LEAD ISOTOPE DATING METHOD THAT HAS BEEN THOUGHT FOR PERHAPS 50 YEARS TO YIELD A ROBUST AGE FOR THE EARTH. BUT HUMPTY IS FRAGMENTED AND THERE IS NO HOPE HE CAN BE RE-ASSEMBLED BY GEOSCIENTISTS.

In 1913, Holmes wrote a short book entitled "The Age of the Earth". In it, he recognised a variety of possible geological clocks, and came down heavily on the side of radioactivity as the only way forward. This was controversial, as most geologists then viewed radiometric dating as unreliable. They favoured the smaller figures emerging from the non-radiometric clocks. In that same year, Frederick Soddy (1913) published his thoughts on variations in atomic mass and coined the term "isotopes". Holmes immediately sought to apply the concept to radiometric dating techniques, but continued to find that this approach brought him few allies.

Interest was greater, however, in the United States and a Committee for the "Measurement of Geologic Time by Atomic Disintegration" was formed in 1923. By 1926, a working group was formed to look at the Age of the Earth, and Holmes was the only non-American member. His role was to evaluate every geologic age measurement that had been made up to that time, amounting to several hundred. He produced a shortlist of 30 acceptable U/Pb dates.

Subsequently to this, Holmes returned repeatedly to this theme, revising and refining the timescale. Perhaps the most influential appeared in a 1947 paper, reproduced as Table 2 (Lewis, 2001). The assigned dates are for the beginnings of each Geologic Period, and they are interpolations from 5 "well constrained lead ages" determined by Alfred Nier.

This table was revised in the second edition (1965) of Holmes' textbook, but Nier's control points were not used because of "poor geological control". However, the revisions were not radical, and Holmes' 1947 timescale was unmatched for at least 10 years. Numerous researchers and popularisers have pointed to the remarkable consistency in the published timescales, from 1911 onwards, despite the subsequent discovery of isotopes and the continual changes in experimental procedures and instrumentation.

"HUMPTY SAT ON A WALL"

In 1946, Holmes and another geophysicist named Houtermans independently formulated a model for lead isotope evolution. This has become known as the Holmes-Houtermans model. This considers the lead isotopes Pb-204, Pb-206, Pb-207 and Pb-208 and proposes changes

TABLE 2:
THE HOLMES 1947 GEOLOGIC TIMESCALE.

Holmes 1947 scale (Ma)	Geologic Period	Age accepted today (Ma)
1	Pleistocene	1.6
12	Pliocene	5.1
26	Miocene	24
38	Oligocene	38
58	Eocene	55
–	Palaeocene	65
127	Cretaceous	146
152	Jurassic	208
182	Triassic	245
203	Permian	290
255	Carboniferous	362
313	Devonian	418
350	Silurian	443
430	Ordovician	490
510	Cambrians	544

from an initial mix at the time of the Earth's origin to various evolved mixtures. Certain of these isotopes change in predictable ways because of the decay of Uranium and Thorium. The model could be used to estimate the primordial mix and the age of the Earth.

In 1947, Houtermans suggested that meteorites might provide a handle on primordial lead in the Solar System. The first results for meteorites were published in 1953 by Houtermans and also independently by Patterson. Both reported a figure close to 4.5 Ga (billion years), very close to the age of the Earth accepted today.

Pre-1953 radiometric dates for the age of the Earth were mostly less than 4 Ga and a figure of about 3 Ga may have been preferred. The challenge then was to revisit the terrestrial material, knowing that the meteorite data pointed to 4.5 Ga.

The next decade was a busy time for geochronologists and they came to the conclusion that lead isotope analysis provides a consistent picture, with the meteorite and terrestrial data following a single isotopic growth curve. The Holmes-Houtermans model was regarded as vindicated. Lead isotopes were not only relevant to the age of the deposit, but they could also be used to date the source reservoir. The assumption of the model was that the Earth's rocks became differentiated at the time of its formation, and the key reservoir affecting lead isotope geology was the mantle. Crustal rocks were considered to be derived by various mechanisms from the homogeneous mantle. The assumptions of the method were stated in standard textbooks, such as that by Faure (1977, 1986).

"HUMPTY HAD A GREAT FALL"

The situation today is transformed. The Holmes-Houtermans model does not fit well into modern thinking about a dynamic Earth. Instead of continental and marine deposits being formed fairly simply from the mantle source, contemporary geological models involve extensive reworking, recycling and mixing processes. The problems are ably discussed by Hofman (2001). For example:

"The original assumptions for both the Gerling-Holmes-Houtermans method and the conformable-lead method are fundamentally inconsistent with our current knowledge of the earth's evolution" (p.224).

"The developments in geochemistry ... effectively rules out the possibility that a truly primitive reservoir is available for sampling anywhere on the earth's surface" (p.224).

"No individual, demonstratively primitive, geochemical reservoir is available today to which we could apply the holmes-houtermans model, and no amount of averaging, conducted by nature or on a computer, is likely to reconstruct reliably the composition of the present-day bulk silicate Earth reservoir from rock samples. As the nursery rhyme ... suggests, no matter how hard we try, we cannot put Humpty together again" (p.228).

If the theoretical model is inadmissible (as Hofman explains in some detail), why is it that the data shows such a remarkable fit? Why does the observational data fit the theoretical curve so well? The answer, according to Hofman, is that we are witnessing a "geochemical accident".

> "It is this remarkable stroke of luck which has given us such remarkably close estimates of the age of the earth from lead isotopes, even though hindsight clearly reveals that the necessary assumption of the holmes-houtermans model … has been grossly violated during the earth's evolution" (p.234).

A scholarly approach to this "coincidence" needs to attempt an explanation. hofman explores this by discussing the way uranium and lead atoms might be expected to behave during rock-forming processes. however, the answers are not yet satisfactory and the net result is deemed "fortuitous". "the reasons for this anomalously high enrichment of lead in the continental crust are not completely understood" (p.231).

Hofmann accepts the meteorite data as providing an upper limit for the age of the earth, but we cannot use the terrestrial lead isotope data to give either a lower limit or a best estimate for the earth's age. "…we cannot … refine our estimates of the age of the earth to closer limits than those given by other, independent information" (p.233).

HUMPTY IS DEAD, BUT DOES IT MATTER?

According to Hofmann, other independent sources of information are available. "There are, however, other firm limits on the age of the Earth" (p.233).

This article does not attempt to look critically at these additional approaches to establishing the Earth's age. Rather, the emphasis is to point out that a "geochemical accident" is not the only way to interpret the lead isotope dating story. There may be strong pointers here to human factors influencing the dates that are published and deemed reliable. Instead of saying "How remarkable that Holmes' 1911 figures were so close to the correct values", we might instead ask, "What factors have influenced the publication of radiometric dates since then, so that similarity prevails?"

Some scholars working in the field have expressed personal views that are critical of the different dating systems – often views that never appear in the textbooks. For example, it has been said that Rubidium-Strontium (Rb-Sr) isotopic data are very difficult to interpret because false isochrons are so common. Many have found problems with Potassium-Argon (K-Ar) dating because of degassing since formation, gas retention at the time of formation, etc. In many cases, the radiometric decay constants are not known with sufficient accuracy, and there are problems of standardising outputs from different dating labs. Research papers continue to appear that point out the problems and urge the need for future work.

With these on-going issues to resolve, the claim that the published dates are "independent" of each other is highly questionable. The further claim that consistency between the different dating methods validates the whole approach is also suspect. That the Holmes-Houtermans model has risen to a position of dominance but is now regarded as a "geochemical accident" is a salutary warning not to regard "consistent" data as internally validating.

This article has the goal of raising questions that go beyond those deemed "acceptable" by geochronologists. The fall of the Holmes-Houtermans model must not be shrugged off to allow "business as usual". It is an appropriate time to dig deeper and to explore human factors operating in the whole field of radiometric dating. Non-scientists can easily be overawed by talk of "absolute dating methods" but this inhibition must be overcome.

Creationists have had two responses to radiometric dating. The first response is to focus on challenging assumptions and pointing out inconsistencies. Radiometric dating is presented as fundamentally flawed – and this comes across as "rubbishing" the discipline of geochronology. The other approach is one of recognising the existence of patterns in the isotopic data and then seeking to explain those patterns in novel ways. It is the second of these approaches that is recommended here.

We need to look afresh at the data coming out of dating labs and we need to challenge conclusions that have been unquestioned for decades. The Bible does not speak about isotopes and geochemistry, so constraints are few. Where biblical revelation can guide us is in matters of Earth history. The Earth was brought into being by the exercise of God's miraculous power, so we are not tied to models of planetary aggregation, nor is it obligatory to find mechanisms for the differentiation of the Earth's crust, mantle and core. The Flood in the time of Noah was a catastrophic global event necessarily affecting the Earth's geological record. These are the considerations that stimulate us to raise questions about geological time and to seek alternative explanations for isotopic variations in the Earth's crust. □

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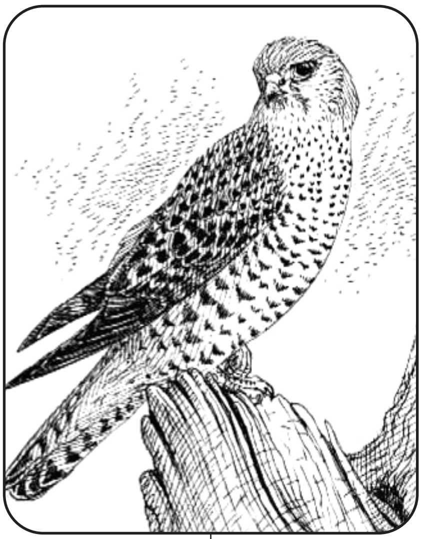

›A GENETIC BOTTLENECK AFFECTING THE MAURITIUS KESTREL.

DAVID J. TYLER

THE MAURITIUS KESTREL population declined (because of pesticide use) to a single wild breeding pair in 1974. It appears that the total population (in captivity and in the wild) dropped to four. This created an extreme genetic bottleneck, analogous in a limited way to the single breeding pairs on the Ark. For a long time, the total population was less than 50 individuals and inbreeding was inevitable. A conservation project was launched and today there are over 200 pairs (Groombridge et al, 2000).

As a general rule, "**Endemic island species show high rates of historical extinction and low genetic variation**". This has been interpreted by creationists that speciation in island birds has resulted in a loss of genetic variability. This form of speciation is, of course, no help to evolutionists, because loss of genetic variability is a step closer to extinction.

Continental kestrels are cited as having a mean number of alleles in the range 4.4 – 5.5. According to Mendelian genetics, 4 alleles per trait is the maximum for any parental pair. Consequently, the small increase in alleles does not represent a major need for allele generating mechanisms within kestrels. A study of the loss of genetic variability of the Mauritius kestrel was carried out by looking at "12 microsatellite DNA loci" using museum skins (up to 170 years old) and modern birds.

As expected, a loss of genetic diversity has occurred on Mauritius. The mean number of alleles dropped from 3.10 to 1.41. This is "broadly in line with the value ... expected from estimates of population size through the bottleneck". However, the ancestral population had a high variability (3.10 is low but nevertheless comparable to continental populations) and the drop in variability still places the variability of the restored Mauritius kestrel population above that of the Seychelles kestrel population (1.25).

It may be worth pointing out that when the island was first colonised by the kestrel there may have been only a few pairs to start with. The high variability indicates that either a long time had passed or that variability has increased rapidly since the colonisation of the island.

From a conservation perspective, this is encouraging. A genetic bottleneck, even when reduced to a single breeding pair, does not mean that recovery is impossible. An ancestral species with a high genetic variability can result in many distinct species, each with a healthy variability.

A most interesting observation relates to "ghost" alleles. "Historical and post-bottleneck genotypes of the Mauritius kestrels at one micro-satellite locus show some of the 'ghost' alleles lost through the bottleneck." The authors do not comment further, even though this is in the title of their paper! Two possible explanations are as follows:

1. The claim of a "single breeding pair" is erroneous. The ghost allele was supplied by another kestrel living through the bottleneck period. (This explanation implies that the breeding population did not drop to two – in which case there is nothing remarkable about the situation except the failure to identify a third bird).

2. Alleles that are lost at a bottleneck of 1 breeding pair can be restored quickly to the gene pool via mechanisms that we have not yet identified. (This explanation suggests there is a lack in the conventional allele theory. The reappearance of such alleles would not be predicted in such short timescales.)

The study of Groombridge *et al* (2000) does not answer the questions posed above, but it does help to stimulate thought about the nature of genetic bottlenecks and possible outcomes. Surtees (2001) discussed the issue in some depth and concluded that the genome is designed to generate variation over a very short time scale. This suggestion has a direct bearing on the situation after the Flood, when pairs of land animals commenced the task of repopulating the Earth and when speciation was rapid. ▢

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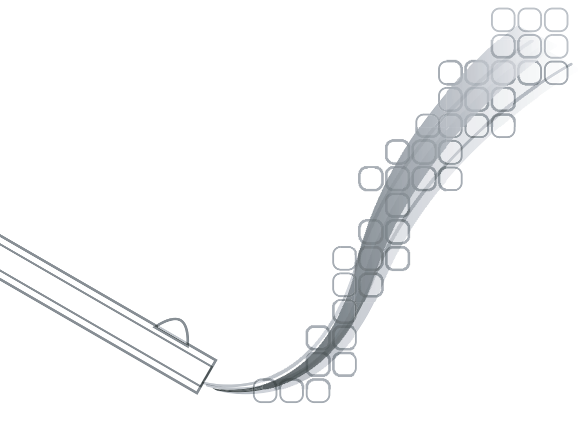
›THE "SMOKING GUN" WAY TO DO GEOLOGICAL SCIENCE.

DAVID J. TYLER

MANY PEOPLE THINK OF SCIENCE as though one basic approach is right for every researcher, whatever the discipline. This, however, does not reflect reality and philosophers of science regularly write about the differences. A useful study by Cleland (2001) is of specific relevance to geological science.

Cleland argues that the historical sciences (those concerned with past events) are different from the empirical sciences (such as physics, chemistry and biology) for several reasons. These include the degree of control exercised by the researcher and the extent to which findings can be repeated. Historical science investigates causes of past events, for which we have only fragmentary data and where the observations are made much later than the actual events. Empirical science investigates causes of directly observed phenomena, with very short time spans between cause and effect.

These contrasts lead, according to Cleland, to some significant methodological differences in the ways scientists work. Empirical science looks at specific hypotheses, particular predictions arising from a specific hypothesis, and searches for data that confirms or refutes the hypothesis. However, historical science needs to work with multiple hypotheses, all of which appear, initially, to offer an explanation of the data. This situation is necessary because of the limitations of the database (often critical data is missing and the events are non-repeatable). The researcher then seeks out critical data that enables one or more of the competing hypotheses to be falsified. Cleland calls this "**searching for a smoking gun that can unambiguously discriminate among competing explanations**". Failure to do this may lead to "just-so stories" that sound impressive but have very little substance to them.



The practical implications of this approach is to encourage researchers to propose alternative hypotheses that appear to satisfy the data. Multiple hypotheses should not be regarded as a sign of confusion. Rather, they are an indication of healthy science. The dangers of not using this methodology is well-illustrated by one of the responses to Cleland's paper (Bailey, 2002).

Bailey points out that routine stratigraphical analysis uses a different methodology. Chains of causation are ignored and the analysis proceeds by making comparisons between ancient and modern sediment sequences. An ancient sandstone, for example, may be identified as a desert sandstone because it has the general characteristics of modern desert deposits. "**By employing the simple stratigraphic "laws", with due allowance for the many gaps in this record, the stratigrapher can build a picture of changing environments and basin filling episodes through time. If this is the derided just-so story, then so be it**".

Cleland then pointed out that the problem of limited data must not be lightly dismissed. If researchers apply their minds to the challenge, competing hypotheses can be found. "**Because scientists are so free to fill in the large gaps in their current knowledge with different assumptions about background conditions and physical processes, it is often fairly easy for them to invent plausible alternative explanations.**" The tendency of stratigraphers to build up a story by analogy with modern-day sedimentation can lead easily to other equally valid explanations being overlooked.

A good example of the problem is provided by Ager (1993). He discusses a locality is in the Lower Jurassic near Swansea, which overlies Carboniferous Limestone. The limestone is overlain by various sedimentary deposits. One of these is called the "Sutton Stone". Ager writes: "**This has usually been interpreted as the basal conglomerate of a diachronous transgressive sea. It has been suggested, with very little fossil evidence, that this conglomerate spans three to five ammonite zones and therefore up to five million years in time. I think it was deposited in a matter of hours or minutes**" (page 120). He goes on to explain his reasons for this reinterpretation, although these need not concern us here. The point that I am illustrating is that multiple hypotheses are not only possible, they are urgently needed if geologists are to avoid shoe-horning data to fit a favoured interpretation.

Diluvialists look upon these exchanges with great interest. Much has been written about uniformitarianism and the doctrinaire way the interpretation of ancient sediments is driven by the presumption that the present is the key to the past. The consequence has been a plethora of "just-so stories". Ager's plea for a fresh look at stratigraphical interpretations has largely fallen on deaf ears. With Cleland's methodology, we have another chance to make a positive contribution. Diluvialists can actually stimulate the generation of alternative hypotheses and thus be of service to geological science. ▢

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›TEACHING THE TRUTH ABOUT EVOLUTION.

PROFESSOR EDGAR ANDREWS
AT THE GENERAL SYNOD OF
THE CHURCH OF ENGLAND

MEETING IN YORK,
JULY 2002 - REPORT BY
PAUL BOYD-LEE

THIS WAS A FRINGE MEETING WITH THIS TITLE, organized by Church Society where nearly 50 people, including clergy and laity attended, but sadly, no bishops were in evidence, which was a shame because of the outspoken comments some haved made recently.

The presentation was prompted by news stories surrounding Emmanuel College in Newcastle where Creation is taught as an alternative to the Theory of Evolution. Because of this, a number of academics (pro-evolutionists and atheists, including several bishops), wrote to the Secretary of State for Education protesting against such teaching. Questions were even raised in the House of Commons about it. Eventually it led to 27 professional scientists writing a combined letter to Estelle Morris (Secretary of State for Education) in response and justifying the need to teach Creation alongside Evolution if needs be.

Professor Andrews drew attention to the serious question raised of what should we teach children about origins, and particularly from a Christian perspective. Various options are open, he said, which include:

1. **To avoid the subject completely**, which in fact is what already happens in some churches where the minister might not be technically minded enough to tackle the questions. In fact this is not really an option. Very often, youngsters raise pressing questions such as, ‘Where did I come from?’ or, ‘If I am an accident, thrown upon a beach, then is there any real meaning for me? But if on the other hand I am created in the Image of the Creator God, then that is very different’. Therefore, the questions must be addressed.

2. **To teach only Creation** and eliminate the teaching of Evolution. However, it is unbiblical to suppress the opposition for, as the apostle Paul said, ‘... the weapons of our warfare are not carnal.’

3. **To teach nothing but Evolution**. This was the thrust of most of the letters sent to Estelle Morris. They suggested Evolutionary theory should be dominant.

Edgar Andrews continued by pointing out that Evolution has two distinct ideas, ‘micro’ and the ‘macro’ changes. Microevolution is a genuine and valid science which includes, for instance, genetic mutations induced by radiation. ‘Natural Selection’ is said by most scientists today to be a reversible influence. Another example would be populations of seagulls getting separated geographically and then developing in their separate ways. The best way of illustrating microevolution is in ‘breeding’, whether it be animals, plants or other living things. However, you can only go so far with breeding because size and other characteristics, for example, have their limitations.

One problem with the theory of evolution is that it extrapolates from micro to macro in order to explain such things as the origins of life. Creationists, on the other hand, maintain that macroevolution cannot be explained by extending the mechanism of microevolution.

In conclusion then, microevolution is an observed phenomenon but macroevolution is still a tentative concept. Professor Andrews mentioned that whilst speaking at an overseas institute recently it was pointed out to him, ‘for us macroevolution is simply a working hypothesis, it is simply a framework within which to work.’

So what are the problems associated with evolutionary theory? Michael Behe’s book, Darwin’s Black Box, gives a devastating critique of Darwinian evolution and most of the criticism has centered on Darwin saying that his theory would fail if life could not be shown to be numerous successive small modifications. The biological world is composed of a host of complicated systems, like blood clotting for instance, where eleven or so factors all have to work hand in glove in order for it to work. The question is, how can this be achieved by a Darwinian type mechanism?

These things ought to be taught, but evolution is being published as fact. Take for example, the genetic code of four different letters; could that have been arranged by accident? Yet, that is what is being taught.

There are situations where, if the theory of evolution is criticized, then the critics are hounded out of court. That happened in the case of Sir Frederick Hoyle who in his later years wrote *Evolution from Space* with Chandra Wickramasinghe. One author was an atheist and the other a Buddhist and they put forward the idea that life was not caused by evolution but came from outer space. Hoyle said that the probability of life arising by chance was no more than that of a Boeing emerging after a whirlwind hit a junkyard containing all the component parts of the plane. But it was these people who were more or less hounded by their peers because they dared to challenge the received theory of evolution.

It is important that Christians should believe in a Creator God. Even if everything came about by natural law, the question needs to be asked, Who put these laws in place? Today, it is not even “scientific” to ask this because science assumes these laws were there in the first place. However, as Christians we claim that God upholds everything by His power. □

›THE BCS 2002 GEOLOGY WORKSHOP.

THE FIELD EXCURSION IN 2002 was to a quarry in the Lower Coal Measures, where we were able to examine mudstones siltstones and sandstones, together with coal seams and fossil trees. In all, the remains of 6 vertical trees were investigated, together with numerous other horizontal branches and roots.

The trees were not growing in a soil, and the discussions of this very significant finding contributed much to our enjoyment of the day.

Four presentations were made on the second day. Brief outlines are given in this report.

THE FORMATION OF KAOLIN AND THE CORNISH CHINA CLAY INDUSTRY.

The Cornish industry is centred on the St Austell Granite, which continues to be a major producer of china clay for domestic use and for export. The presentation was stimulated by a visit to several of the St. Austell pits in January 2002. The background geology was reviewed by David Tyler, leading to the identification of three significant variables in the kaolinisation process. These are: the composition of the granite, the influence of hydrothermal fluids affecting the granite; the influence of meteoric water in the transformation of minerals. The currently-favoured model of kaolinisation was reviewed to indicate strengths and limitations. Reference was made to other kaolin deposits in Europe and in the US, as these introduce additional considerations and constraints. What seems clear is that kaolinisation is a complex process, typically followed by intense weathering, and there are indications that the main phase of alteration was geologically quite short. The potential for developing a model of kaolinisation that is consistent with biblical timescales of history is high.

ORDOVICIAN TRILOBITES FROM CENTRAL WALES

This presentation was based on the PhD research of Peter Sheldon of the Open University (published in Nature in 1987). A weekend excursion was held earlier this year and attended by Paul Garner. This allowed Paul to see the sites represented by Sheldon's research, and to gain considerable familiarity with the findings as a result of the researcher's tuition. Seven sections of strata were studied in greater detail than had ever been attempted before. Altogether, Sheldon collected 15,000 trilobite specimens. When he tried to identify the trilobites, he found small, but significant, deviations from published type specimens. This led to Sheldon mapping gradational change in several of the trilobites represented. The paper attracted controversy, because Darwinians saw it as a vindication of their position, whereas the advocates of punctuated equilibrium were much more cautious. Paul's review covered many issues, but chief were these.

1. The level of detail of the analysis affects the patterns we see.
2. The trends observed are real, not imaginary. a related aspect of the research was the confirmation of biostratigraphical correlations reported by others.
3. The observed changes are all consistent with what we know of basic type biology. a post-flood recolonisation model helps us to explain these trends.

CAMBRIAN TRACE FOSSILS FROM THE ERIBOLL SANDSTONE

The third presentation by Michael Garton, took us to NW Scotland: the Lewisian basement rock layers, the Torridonian Formation and the Eriboll Sandstones. The upper surface of the Lewisian is far from flat, the relief is extreme and soft sediment deformation in the overlying Torridonian is ubiquitous. By contrast, the unconformity with the Cambrian strata is planar. There is no evidence of a deeply weathered surface at the Torridonian surface. The first 90 metres of the Cambrian Eriboll Sandstones are characterised by massive (high energy) cross-bedding and no direct evidences of life. Then comes about 100 metres of 'piperock', fossilised vertical worm burrows. We were shown the main features of these trace fossils and some reasons why they should be considered escape shafts rather than dwelling burrows. The millions of years associated with these rocks bears no relation to the field evidences, which suggest much shorter timescales.

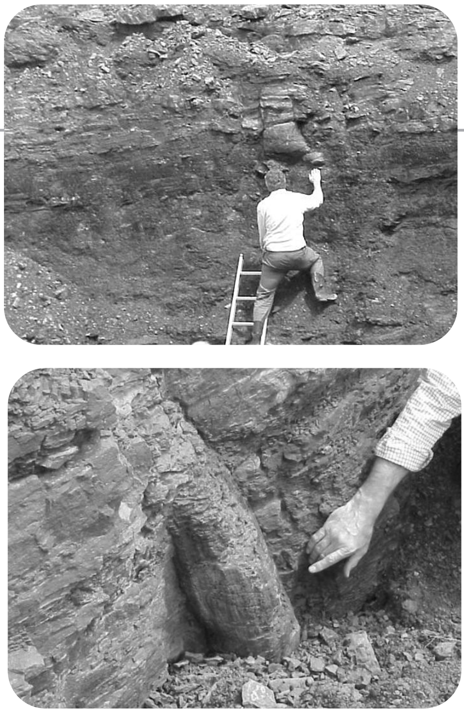
THE RATE PROJECT (RADIOISOTOPES AND THE AGE OF THE EARTH)

In anticipation of Andrew Snelling's visit to the UK in early October, Paul Garner reviewed the work of the RATE group and their recently published book. Paul recommended Russell Humphreys' chapter on evidences for much radioactive decay in the past. The evidences were drawn from the maturity of radiohalos, the equilibrium proportions of daughter isotopes, fission track data and the Earth's heat flow data. The conclusion Humphreys draws is that six thousand years of decay at current rates cannot account for these data. Humphreys goes on to argue that there are real trends in the calculated radiometric ages, and these need to be explained. The RATE group have concluded that whilst catastrophism has disrupted radiometric clocks, this is an inadequate response to the observed trends, and accelerated decay rates in the past must be a key part of the reinterpretation. Humphreys also draws attention to independent evidence of accelerated decay rates in the recent past: the large scale retention of helium in the Earth's crust. There is far too much helium there to be consistent with expected diffusion rates over geological time. However, the data are consistent with accelerated rates in the recent past. A research program to further explore this issue is under way. Paul suggested possibilities for fruitful interaction with the RATE group.

This workshop provided a relaxed and constructive forum to develop geological ideas that are consistent with biblical timescales of history. We hope that in future years, other BCS members with an interest in the earth sciences will be able to join us and contribute to our discussions. ▢

EDITORIAL COMMENT:

Ongoing work by the RATE (Radioisotopes and the age of the earth) project is throwing further light on these issues, with evidence supporting a much younger age of the earth than that quoted by uniformitarian scientists. It is hoped to review their publication 'Radioisotopes and the Age of the Earth' Vardiman et al (2000) in a future issue.



›FIGURE 1. VERTICAL FOSSIL TREES INVESTIGATED DURING THE FIELD EXCURSION

›TYPING MONKEYS PRODUCE A MESS!

DAVID J. TYLER

If an infinite number of monkeys are given typewriters for an infinite time, would they eventually produce the complete works of Shakespeare? Judging by the responses of some philosophers and mathematicians, the answer is yes. However, it was only in 2002 that a practical experiment was carried out to gain a real-world insight into the question.

Of course, the experiment did not involve an infinite number of monkeys – there were only six! And they shared one typewriter, or rather, a keyboard linked to a computer. When a key was struck, something happened on the screen, and this was reported as helping to sustain interest in the monkeys.

Paignton Zoo Environmental Park, Devon, was the scene for the project. The monkeys were Sulawesi Crested Macaques with the names Elmo, Gum, Heather, Holly, Mistletoe and Rowan. The computer was protected by a Perspex box with holes through which the keys could be touched. Part-funding was provided by the Arts Council of England (strictly speaking, this was a 'performance' rather than an experiment).

After six weeks of opportunity, the monkeys had produced six pages of text. All those calculations based on monkeys typing two letters a second were revealed to be widely astray!

Nevertheless, with six pages filled with letters, surely some words would be produced? With so many words to choose from, something recognisable might be expected to emerge. One problem was the lack of use of the space bar – strings of characters without spaces will never be meaningful. However, I did detect the letters 'mass' hidden within one long string. Does this count as a positive result?

The most important lessons related to the concept of randomness. Most definitely, the letters were not typed randomly. According to Mike Phillips, who runs the Institute of Digital Arts and Technology at Plymouth University, 'They pressed a lot of S's. Obviously English isn't their first language! (Yahoo News, 2003). Next in popularity were A, J, L and M. Randomness was notably absent.

The monkeys did not seem to enter into the spirit of the exercise. The lead male picked up a stone and started bashing the keyboard. All of the monkeys could be found sitting on the computer. 'Another thing they were interested in was in defecating and urinating all over the keyboard' said Mike Phillips.

The web site reporting the exercise says: 'The project is clearly not a scientific experiment, but hopefully does display some sense of integrity. Although it appears to test the truth of the formula, in reality it emphasises the unreliability of human (scientific) hypotheses. Animals are not simply metaphors for human endeavour.'

The origin of the typing monkeys metaphor goes back to Arthur Eddington's Gifford Lectures of 1927.

' ...If I let my fingers wander idly over the keys of a typewriter it might happen that my screed made an intelligible sentence. If an army of monkeys were strumming on typewriters they might write all the books in the British Museum.'

How this quote was embellished (or simplified!) to 'reproduce the entire works of Shakespeare' has yet to be properly documented. Nevertheless, the metaphor has entered the popular mind and has certainly influenced generations of people. The message conveyed is that given enough time, any chance event is possible.

We can be thankful to the macaques of Paignton Zoo for reminding us that whilst 'randomness' exists in the minds of mathematicians and philosophers, we must be very careful before thinking it actually exists anywhere else. Real world systems rarely conform exactly to our predetermined ideas and mathematical analysis. This is true of the roulette wheels of Monte Carlo as well as anything else that we like to think of as random.

The favoured application of the typewriter metaphor is the origin of life through chemical evolution. 'Give a primordial soup enough time, and living reproducing cells will emerge'. However, the macaques' performance should help us to see the flaws in this evolutionary story. Give a mixture of chemicals enough time, and it will reach a state of equilibrium! ▢

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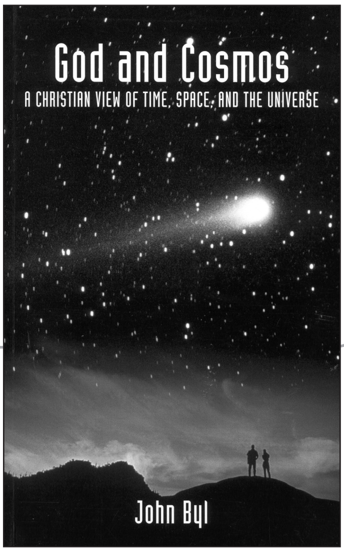
Give six monkeys a computer, and what do you get? Certainly not the Bard
David Adam, The Guardian, Friday May 9, 2003

Typing Monkeys Don't Write Shakespeare
By JILL LAWLESS, Yahoo News, May 9 2003

›GOD AND COSMOS
(A CHRISTIAN VIEW OT TIME, SPACE, AND THE UNIVERSE)

AUTHOR: JOHN BYL
PUBLISHER: BANNER OF TRUTH
NO. OF PAGES: 243
DATE: 2001
ISBN: 0 85151 800 1

BOOK REVIEW BY:
BILL WORRAKER



TODAY'S MEDIA WOULD HAVE US BELIEVE that the big bang theory of the origin of the universe is indisputable 'scientific fact'. John Byl strongly challenges that view by highlighting many scientific and logical flaws in modern cosmological thinking.

Having indicated that the fundamental issue is the authority of Scripture, Byl demonstrates how modern naturalistic cosmologies suffer from a range of problems in explaining the relevant observations, and that all require adjustments to remain viable. He also helpfully cautions that we need to be aware of the philosophical presuppositions underlying any cosmological theory we wish to assess.

Byl then considers the interaction of cosmology and theology, in particular the cosmological and teleological arguments for the existence of God. His broad conclusion is that none of these is decisive, and that the attributes of God which can be deduced in this way are very limited compared with what is revealed in Scripture. Having considered the (dismal) future as envisaged in naturalistic cosmologies, Byl then discusses the 'gods' invented by proponents of such cosmologies, concluding that modern cosmology cannot easily accommodate the basic ingredients of true religion: a supernatural God and subjective immortality.

After a robust defence of the traditional conservative evangelical interpretation of the Genesis account of creation, viz. that God created the entire cosmos in six days about 6000 years ago, Byl critically examines several creationist cosmologies. These take the universe to be only thousands of years old and seek to explain how we can see remote galaxies whose light has apparently taken billions of years to reach us. Byl finds that these cosmologies all have serious shortcomings but, because of possible future improvements, none can be completely ruled out.

However, Byl seems to endorse mature creation (the concept of a creation with built-in apparent age) in the particular form which proposes that God created the cosmos as a complete, fully-functioning unit including light in transit from the stars and galaxies. Although this idea neatly solves the 'distant starlight' problem and cannot be falsified, there is no evidence in its favour. Furthermore it implies that galaxy light did not originate in the galaxies themselves and that observed distant events (e.g. supernovae and gamma-ray bursts) never actually happened. Mainstream creationist groups do not favour this view. Byl seriously questions the apologetic value of biblical cosmologies, and sums up by saying: 'I would suggest that scientists should concentrate on operation science [i.e. not 'origin' science], with the prime aim of developing useful technology.' (pp.213,214). This very negative position denies the value of most astrophysical research. Moreover, whether intentionally or not, Byl is thus dismissing 'creation science' work as practically worthless. I emphatically disagree with him!

In summary, although there is much valuable, thought-provoking material in this book to help us see the fallacies of modern cosmology, Byl's excessive scepticism will not enhance your appreciation of the starry heavens. ▢

›THE DATING GAME
(ONE MAN'S SEARCH FOR THE AGE, OF THE EARTH)

AUTHOR: CHERRY LEWIS

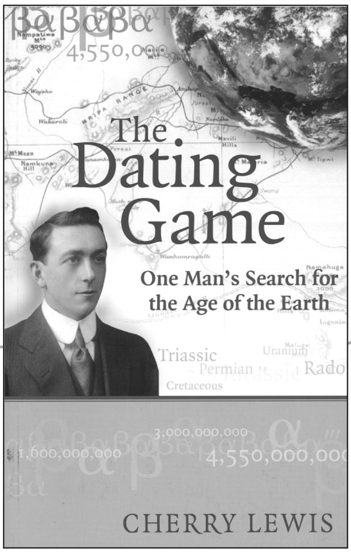
PUBLISHER:
CAMBRIDGE UNIVERSITY PRESS

NO. OF PAGES: 253

DATE: 2000

ISBN: 0 85151 800 1

BOOK REVIEW BY:
DR BILL WORRAKER



ARTHUR HOLMES (1890-1965) was the eminent British geologist sometimes known as the "father of geological time scales". With singular determination he pursued the development of geological dating methods based on the radioactive decay of uranium and thorium to lead in order to establish both the age of the Earth and an 'absolute' geological time scale.

In this engaging and informative biography Cherry Lewis neatly weaves together the story of Holmes' personal life and struggles with that of his scientific career. She recounts some fascinating episodes – for example Holmes' mineral prospecting expedition to Mozambique in 1910 and 1911, during which he almost died of blackwater fever, and his period in Burma (1920-1922) as chief geologist to the ill-fated Yomah Oil Company, during which his son Norman died of dysentery before the age of 4, and which left Holmes and his wife Maggie practically destitute.

However our main interest is in the way Holmes' beliefs and preconceptions influenced his scientific judgements regarding geological time, particularly with respect to the age of the Earth. As documented by Burchfield (1975), the late nineteenth century was a time of ferment in geology regarding the age of the Earth. Most geologists and palaeontologists, strongly influenced by Hutton, Lyell and Darwin, wanted practically indefinite spans of time to accommodate all the successive stages they believed they had recognized in the past progression of life. However Lord Kelvin, the most influential physicist of the day, had calculated that the Earth could not have been more than a few tens of millions of years old if it had cooled from an initially molten globe with no additional source of heat. This conclusion was generally, though reluctantly, accepted by geologists until the discovery of radioactivity by Becquerel in 1896 and the subsequent realization that radioactive elements inside the Earth could provide the heat source missing from Kelvin's calculations.

Although in principle these discoveries allowed (but did not demand!) a practically unlimited gelogical time-span, it seems from Lewis' account that early twentieth century geologists were generally very reluctant to abandon time-spans measured in tens of millions of years at the most. The two main ways of estimating geological time were (i) the salinity method, pioneered by John Joly, which was based on the build-up of river-borne sodium in the oceans, and (ii) the sedimentation method of Samuel Haughton, who assumed that observed thicknesses of sedimentary rock strata were proportional to the time taken to deposit them and used observed ocean floor sedimentation rates for calibration. Both approaches were subject to considerable uncertainties and sometimes ad hoc adjustments, which may be why Holmes, with his primary scientific training as a physicist, always regarded them with contempt. Thus Lewis records (p.218) that Holmes wrote even as early as 1912: "ultimately we may drop the use of sedimentation and salinity as methods of measuring time ..."

With this backdrop, we can perhaps understand why Holmes was, for so much of his career, out on a limb in his efforts to measure geological time using the radioactive decay of uranium to lead as his chronometer. Although the details of this radioactive system were far from understood and analytical measurement techniques were very primitive by today's standards, Holmes published his first book, "The Age of the Earth", in 1913. He included a geological time scale based on a few uranium-lead measurements, about which Lewis comments (p.64): "The correspondence of Holmes' values with those of today is remarkable", and (p.65): "Holmes' first attempt at a geological time scale has withstood the 'test of time' remarkably well." Remarkably well indeed – perhaps suspiciously so, bearing in mind that the possible presence of non-radiogenic lead had not been considered, and the discovery of a variety of lead-producing decay chains (uranium 238 lead 206, uranium 235 lead 207, thorium 232 lead 208) still lay well in the future. Could these early results have had a strong influence on subsequent isotopic dating results, i.e. on what was published and what was rejected? Many must have been rejected; we shall never know how many. And doubtless in many cases there will have been good technical reasons, such as incorrect labelling of rock samples, contamination, etc. But the suspicion remains that many would have been rejected because they contradicted the investigator's expectations, which can always be done on reasonable-sounding pretexts; Lewis records Holmes on one occasion defending the uranium-lead method against observed inconsistencies thus (p.116): "When inconsistent ratios are obtained there is either evidence of extreme alteration of the minerals or it has been contaminated due to the presence of 'ordinary' lead." Inconsistencies in isotopic dating results are frequently explained away in this manner, even when the proposed explanations are not necessarily reflected in the field or mineralogical conditions of the rock sample.

Over 30 years later, in 1947, Holmes produced his 'B' geological time scale. This was intended, as Lewis notes (p.208): "... to resolve the old conflicts between the hour-glass and the radiometric methods 'in a reconciliation of converging evidence' ". But just how was this reconciliation achieved? Holmes used as controls five isotopic data points provided by the physicist Alfred Nier. He had thus rejected 20 out of the 25 samples measured by Nier, but Lewis does not explain why. Even more telling, perhaps, is the way the time scale itself was constructed. Holmes used Haughton's principle (essentially, the constancy of sedimentation rates) to scale geological time according to sediment thicknesses between his control points. The evident circular reasoning in this procedure seems to have escaped both Holmes and Lewis – the hour-glass and radiometric methods had been forced to agree by using the latter to calibrate the former! Lewis had previously (p.194) noted the possibility of circular reasoning when trying to date sedimentary rocks by means of intrusive igneous rocks, but in discussing the Holmes 'B' scale she regards "poor geological control" (p.211) as the major source of inaccuracy. Thus we see how the scientific judgement of both Holmes and his biographer was governed by their belief in the essential validity of a geological time scale of the kind Holmes had constructed.

It is also instructive to follow how Lewis describes the various "ages" derived for the Earth as isotopic dating techniques developed both experimentally and theoretically through Holmes' career. In 1911 Holmes was convinced that the age of the Earth was "fairly well constrained" (p.100) at 1,500 million years, presumably because no uranium-lead dates obtained by then had exceeded this figure. In about 1925, Lewis reports (p.148), Holmes had stated emphatically: "it is clear that the Earth ... cannot have existed for so long as 3,200 million years", essentially because the oldest minerals so far dated gave much younger ages than this. Later (p.171) she notes that Holmes wrote in his contribution to the 'Age of the Earth Committee' findings of 1931: "... the age of the Earth exceeds 1460 million years, is probably not less than 1600 million years, and is probably much less than 3000 million years". He had apparently rejected many analyses (including all available helium analyses) which did not fulfil his reliability criteria, basing his conclusions on only 30 out of the hundreds available for the uranium-lead and thorium-lead radioactive decay systems. Whatever the intrinsic merit of Holmes' selection criteria, his procedure guaranteed a strong degree of mutual compatibility amongst the results, especially since he appears to have been virtually the sole judge and juror!

Holmes' view of the age of the Earth only began to change after 'ordinary' lead (lead 204) was identified by Alfred Nier and much more precise isotopic determinations than before became available in the 1940s. These analyses began to produce greater "ages" than ever before recorded for rocks, and it is interesting to note that Nier claimed of one rock sample that it "... appears to have an age close to two billion years" when the actual figure he had obtained was 2.57 billion years (p.197). In one sense Nier's reticence is commendable, but it demonstrates once again how published results can be influenced by the beliefs of the author and his intended readership; Lewis records that at the time astronomers believed the universe to be 2,000 million years old. Apparently Holmes was not as reticent as Nier in accepting these higher figures for the ages of rocks; Lewis portrays him as showing contempt for results from other disciplines (in this case astronomy) when they conflicted with his own ideas. By 1946, using Nier's isotopic data and his own reassessment of the geological issues, Holmes had calculated that it was about 3,000 million years since "... the Earth's primeval lead began to be contaminated by radiogenic lead." (p.202) He commented (pp.202/3): "This looks like being the first really reliable estimate of the age of the Earth..." He had used a sample of galena from Invigtut in Greenland for this exercise as it contained "... very low lead ratios and no uranium or thorium" (p.202), and had thus concluded that it represented primeval lead.

Within a few months Holmes' figure had been revised upwards to 3,350 million years. Shortly afterwards the German Fiesel Houtermans produced a figure of 2,900 million years, whereas in 1942 the Russian E. K. Gerling had published a figure of 3,950 million years. All three were using the same model, viz. of lead build-up due to the decay of uranium and thorium starting from the supposed formation of the Earth's crust. However Lewis comments (p.206): "... all made the same fundamental mistake: at the end of the day neither the Invigtut nor any other sample of lead found in the Earth's crust contained the magic primeval lead value." She does not explain how she knows this – if the Invigtut galena contained no uranium or thorium, why was it not primeval?

Later, as Lewis relates, lead isotopic analyses of meteorites began to be used for investigating the age of the Earth. The underlying assumptions were that (i) the Earth, Moon and meteorites were all formed from the same collapsing cloud of protoplanetary material and (ii) meteorites were not subject to the geological processes which alter minerals on Earth. Iron meteorites, notably the Canyon Diablo meteorite, were favoured because of their negligible uranium content and by 1953 lead isotopic analysis performed by Claire Patterson on samples from Canyon Diablo had produced a figure of about 4.6 billion years for the age of the Earth. However, as Lewis notes (p.225), the genetic link between Earth and meteorites [assumption (i) above] had not been established. In order to do this, Patterson measured lead isotope ratios for three stony and two iron meteorites and plotted the results on the same diagram as the results for samples of sediment from the floor of the Pacific Ocean. The latter samples were supposed to contain lead isotope ratios representative of the Earth's crust as a whole. According to Lewis, all these results plotted on a straight line in the diagram of lead isotope ratios, indicating a common isotopic age (4,55070 million years) for all the meteorite and terrestrial samples, and thus proving the required genetic link. This work was published in 1956. Within a month Holmes published his final contribution on the age of the Earth. Although he scorned the use of meteorite data for investigating the age of the Earth, he obtained a figure very similar to Patterson's.

As far as Lewis is concerned, this is practically the end of the story. Although she admits that Patterson's results are now seen as somewhat fortuitous (pp.227, 228), both Patterson and Holmes are portrayed as brilliant scientific heroes. Throughout the book Lewis writes as one knowing "the answer" for the age of the Earth, as if Holmes and contemporaries had been set a puzzle which, by a combination of hard graft, persistence and genius, they had eventually managed to solve. However, as we have already noted, the results of many isotopic determinations were discarded along the way, very likely many more than recognized by Lewis. No doubt the results would otherwise have shown far more scatter and would have been far less convincing. We have also noted Holmes' cavalier attitude towards methods of estimating geological time which conflicted with his own ideas; this is further illustrated by comments made in his inaugural lecture as Regius Professor of Geology at Edinburgh University in 1943. In Lewis' words (p.188) "... showing how present erosion rates are much faster now than in the past. He blamed this on Man ..." In fact present-day land erosion rates are orders of magnitude too high to be consistent with the geological time scale espoused by Holmes (Oard, 2000), but rationalizations are sought in terms of how supposedly ancient landforms could have been preserved against erosion for up to hundreds of millions of years, not in terms of erosion-inducing human activities. Thus while in 1943 Holmes pronounced on erosion rates with great authority and confidence, it now appears that on this issue he was speaking in ignorance.

Our brief recounting of some of the statements made about the age of the Earth through Holmes' career also serves to illustrate that the confidence placed in a particular scientific result by its author is often misplaced in the light of subsequent developments. What then are we to make of Lewis's obvious confidence that the age of the Earth is no longer a live issue – a question of historical interest only? We have noted Holmes' deep contempt for ideas and results which conflicted with his own, his extensive rejection of isotopic data which did not meet with his approval, and the remarkably strong influence which his early results on geological time scales seem to have had upon subsequently-published results

Creationists believe the Earth to be "only" thousands of years old as a result of reading the Bible straightforwardly, and because we trust its Author. On investigating the methods used by uniformitarian scientists such as Holmes and Lewis who believe the Earth to be billions of years old, we find that their supposedly factual conclusions are based on many subjective judgements and much circular reasoning. Alternative ways of estimating geological time indicating a much younger Earth have been ignored or derided rather than falsified. Our faith in the reliability of the Author of the Bible is thus confirmed rather than shaken. Lewis's book is a good read, and historically very informative, but do not imagine that it tells the definitive story of the age of the Earth. ▢

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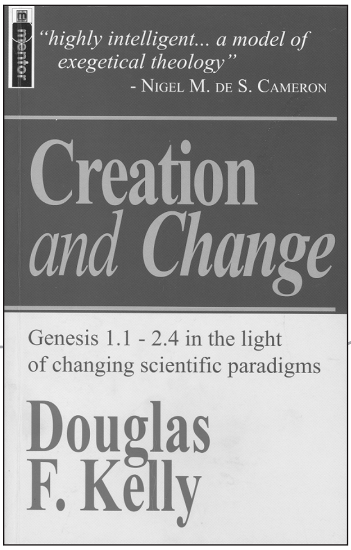
For futher reading

'Dating the Earth and accidents of Geochemistry' page 8, this issue.

›CREATION AND CHANGE

AUTHOR: DOUGLAS F. KELLY
PUBLISHER:
CHRISTIAN FOCUS PUBLICATIONS
DATE: 1997
ISBN: 1 85792 283 2

BOOK REVIEW BY:
DAVID J. TYLER


mentor
"highly intelligent... a model of exegetical theology"
- NIGEL M. DE S. CAMERON
Creation and Change
Genesis 1.1 - 2.4 in the light of changing scientific paradigms
Douglas F. Kelly

DOUGLAS KELLY IS PROFESSOR OF SYSTEMATIC THEOLOGY at Reformed Theological Seminary, Charlotte, North Carolina. In the early 1990s, he taught a course to an adult Sunday school class. The experience of researching, teaching and responding to questions was the dominant input to this book. The result is a book that engages with numerous scholarly issues at a level appropriate for a wide range of readers.

In the author's view, "the question of origins is one of the most significant that a person ever faces: where we came from is crucial to understanding who we are and where we are going" (p.15). He gives a personal reminiscence of Francis Schaeffer speaking at L'Abri, in which Schaeffer made it clear that origins issues (creation, the image of God in man, human origins) are so important that to pass them by in evangelism is effectively to undermine the Gospel message. "Schaeffer thought that when one avoids those questions, which are deeply implanted in every human heart, and jumps immediately to salvation, one loses the major impact on those who are seeking the truth" (p.17).

How then are Christians to develop their thinking on origins? Where do we start? "The Bible is God's revelation of his Word to us and includes all we need to know concerning his will for our lives. Notice how God chose to begin this all important book. He initiated his whole revelation with a description of creation, demonstrating that it is not only primal in the historical sense, but primary for the understanding of other doctrines as well" (p.16). This emphasis pervades the book: Douglas Kelly sets out to expound, teach and discuss the text of Genesis 1:1 – 2:4 regarding it as foundational for Christians.

A further emphasis in this book is that the Bible speaks to the real world and is not confined to a special "religious" domain. There is no concession to those who distinguish between "secular" and "spiritual" knowledge. "If we avoid dealing with what the Bible says about creation of the material universe, then there is a tendency for religion to be disconnected from the real world, or to change the figure, there is a tendency to put Scripture and Christianity into a stained-glass closet that does not impact the space/time realm" (p.17).

Since this book addresses numerous topics and there are so many interesting avenues of thought to explore, it is necessary in this review to focus on a few topics. I have chosen those where I think the book has much to contribute to contemporary debate.

What type of literature is Genesis 1? This is one of the most important hermeneutical questions today for Christians to answer. Kelly considers all the approaches held by contemporary scholars and concludes that the chapter is essentially historical. He recognises that Genesis 1 has an elegant literary form, but argues that there should be no dichotomy between literary form and historical, chronological fact (p.119). The most significant challenge to this (traditional) interpretation of Genesis comes from the Framework Hypothesis. This view considers that Genesis 1 brings us theological truth embedded in a literary structure intended to bring us theological truth abstracted from real history.

Kelly's evaluation of this approach is excellent and deserves to be widely read. He summarises his two reasons for rejecting the Framework Hypothesis. "First, by importing an alien interpretation procedure into Scripture (the dichotomy between form and fact), they unwittingly obscure the pure light God's Word shines into our understanding of space/time reality as well as the transcendent realm controlling it. And secondly, they do a severe disservice to naturalistic science, precisely because such an obscuring of the full light of divine truth fails to call those in darkness to a full-fledged, repentant restructuring of their whole intellectual world at the deepest level" (p.120).

A second major contribution of this book relates to understanding of the relationship between verse 1 and the rest of Genesis 1. Traditional Bible translations have Genesis 1:1 as an independent statement, grammatically separate from verse 2. This translation leads directly to the "ex nihilo" understanding of creation. However, some translations have interpreted Genesis 1:1 as a temporal clause: "When God began to create". This leads to the idea that matter existed prior to God's creating activity. Kelly's discussion of these issues is clear and helpful, concluding that the traditional understanding is correct.

Thirdly, Kelly explains helpfully the role of Genesis 2:4, "These are the generations of the heavens and the earth". Is this a superscription (or title of what follows)? Or is it a superscription (a summary of what precedes)? This verse is "important for the structure of Genesis; it stands in the Hebrew text like a great signpost on a major highway, pointing the way forward into the rest of the book" (p.46).

The conclusion, that 2:4 is a superscription, is crucial for dealing with the oft-heard view that there are two creation accounts. Some Bible translations make this mistake and encourage people to say not only that there are two creation accounts but also that they do not agree. However, "instead of constituting a contradictory repetition of Chapter 1, the material in Genesis 2:4 – 3:24 accomplishes something else in order to open the gates for the grand story of redemption; the central theme of the whole Bible" (p.47).

There is so much of value in Kelly's book that it might seem inappropriate to add some critical remarks. However, in what follows I draw attention to some deficiencies in the book that prevent if from being as useful as it could be.

Theistic evolutionists ought to be challenged by this book, but I fear they will find many "distractions" to divert their attention from the real issues. Kelly suggests that the motivation behind the theistic evolution position is accommodation. He sees their understanding of the Bible as fundamentally flawed. In the UK, I think the most likely response to this is dismissal. This will be regarded as so wide of the mark that the rest of Kelly's arguments need not be considered further. At one point (p.142), Kelly confuses progressive creationists and theistic evolutionists – and this again may trigger rejection. We desperately need literature that really understands the mind of the theistic evolutionist and interacts at that level. Kelly's book does not do this.

A second deficiency is that the Ancient Near Eastern background is not explored significantly. It is mentioned in a few footnotes, but there is no interaction with contemporary scholarship that deals with these issues. This is a weakness because scholars favouring the theistic evolution approach deem the Ancient Near Eastern context particularly important. Unless we engage with these studies, we should not be surprised if theistic evolutionists continue to regard us as naive.

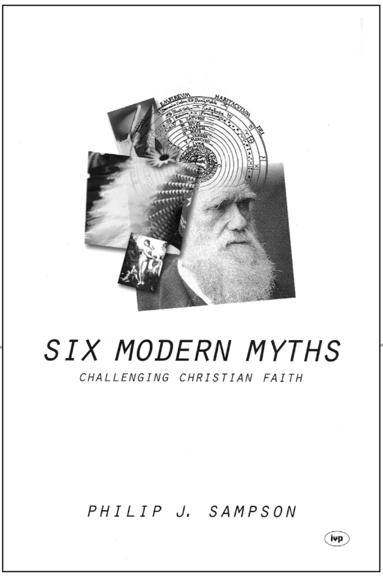
My final concern is the attention given to technical issues, extensive summaries of creationist thinking on issues raised by the study of Genesis. As summaries, they are well done. It is refreshing to find a theologian who can grapple with the issues so well. However, these chapters and technical notes are likely to be appreciated only by those who are persuaded of the correctness of the analysis. Theistic evolutionists will simply find more ammunition here to throw at Kelly.

To end on a positive note, this excerpt is taken from the book's conclusion. "Throughout this volume, I have engaged in a running debate with the secularism of our times and its evolutionary 'paradigm', which, I believe, keeps us from understanding either Scripture or reality. Thus, it tragically turns the gaze of our culture from both God, our Creator, Redeemer and Goal (which is our very salvation), and from a realistic assessment and development of the created realm (which is part and parcel of our 'dominion mandate'). The bitter harvest of this wilful blindness is being reaped with increasing swiftness in our deteriorating Western society. There is only one way for massive intellectual, moral and cultural healing to occur, and it entails a revolutionary 'paradigm shift' from mythological evolution to a Scripturally revealed and scientifically realistic paradigm of special, divine creation. The teachings of Genesis 1 and 2 are sufficiently clear to give us our general orientation in this requisite paradigm shift, and a growing chorus of voices from operational science confirm the latter, even as they deny the former" (pp.244-5). ▢

›SIX MODERN MYTHS
CHALLENGING CHRISTIAN

AUTHOR: PHILIP J. SAMPSON
PUBLISHER:
INTER-VARSITY PRESS
DATE: 2000
ISBN: 0 85111 659 0

BOOK REVIEW BY:
DAVID J. TYLER



THE ENLIGHTENMENT SCHOLARS of the late 18th Century succeeded in influencing an enormous number of people. Lord May, President of the Royal Society, is one of them. He says that “the open culture of the Enlightenment” can be characterised as “rational, humane, questioning”. He believes that these values permeate all scholarly activity today: “the arts, humanities, medicine, science and engineering, as well as the mainstream expressions of all the world’s great religions.” These are contrasted with the “anti-culture of closed fundamentalism” that are discerned in “the rise and fall of the Taliban regime in Afghanistan” and “the recent controversy over the teaching of creationism and evolution in this country”.

Lord May’s views are shared by many intellectual leaders. They believe that Enlightenment values underpin the kind of scholarship that generates new knowledge and they want to build contemporary culture on this foundation. Other voices, coming from a variety of directions, are described as fundamentalist belief systems “whose essence is authoritarian, seeking to suppress questioning and to limit people’s lives, especially those of women”. Lord May’s assessment of this “troublesome battle” between “open” Enlightenment culture and “closed” fundamentalist anti-culture calls for our attention and some response. It should not escape anyone’s attention that Christianity is concerned with God’s revelation of himself in Jesus Christ. This revelation comes with authority and claims to bring genuine knowledge and ultimate truth. It would appear from Lord May’s analysis that Christianity is inherently fundamentalist and therefore to be condemned as close-minded and an alien influence on culture.

In his book, The Pilgrim’s Regress, C.S. Lewis uses the template pioneered by John Bunyan to assess the value of different intellectual traditions. Lewis’s pilgrim is called John and he converses with various people and encounters numerous hazards in his journey to the Island. One of these characters is “Mr Enlightenment” who willingly offers his assistance. Significantly, C.S. Lewis portrays Mr Enlightenment as assertive, close-minded and willing to manipulate history to support his prejudices. In other words, the Enlightenment represents a form of intellectual fundamentalism that is hostile to John’s well-being on his journey. C.S. Lewis was not isolated in this evaluation of the Enlightenment message. Lord May refers to the Enlightenment as rational, but Christians have found it to be rationalism. Lord May describes it as humane, but Enlightenment scholars borrowed this from Christianity. Lord May refers to “questioning”, but Christians have discerned scepticism and a resistance to any answers that involve God’s activity in this world.

Philip Sampson uses John’s meeting with Mr Enlightenment as part of his introduction to the theme of his recent book. “Mr Enlightenment appeals to stories of science and history. ... There are many such stories, and a selection of the most common ones forms the core of this book”. The Enlightenment stories concern Christopher Columbus and voyages of discovery, Galileo and the pursuit of truth, Darwin and the discovery of man’s place in nature and many others. Sampson writes: “Modern myths are, as it were, messages woven out of history and science. But once historical events or scientific theories are incorporated into a myth, once the myth makes use of them, it feeds off them and they become deformed and impoverished. ... To recover the historical richness, we must uncover the myth” (p.13).

The “modern” mind, according to Sampson, “confidently still asserts that it is ‘reason’ and ‘facts’ which sustain its self-confidence and underpin its hope for the future (p.153).” Yet when we look at how the modern mind passes on this belief-system, “we find not facts and reasoning, but stories. From popular encyclopaedias to books by philosophers such as Bertrand Russell, narrative, not analysis, is given a central place in explaining our world to us (p.153)”. There are particular stories that appear repeatedly and six of them are examined in Sampson’s book. The damming verdict is that the stories are embellished and manipulated in ways that sacrifice truth. This distortion, whether conscious or unconscious, has the effect of rewriting history and creating “modern” myths.

The “modern” mind views the Enlightenment as a high point in mankind’s intellectual development. This was the time when the darkness of superstition, bigotry and religious dogma is said to have been swept away by the winds of rational thinking and scientific enquiry. According to Sampson, this mindset is supported, not by rational thinking and scientific enquiry, but by historical revisionism on a massive scale.

The stories of Galileo and Darwin are perhaps closest to the interests of readers of this review. In both cases, the “modern” story presents a war between science and Christianity, with heroes battling nobly against armies of close-minded religious leaders who hold the reins of power. Galileo fights the “Geocentrism” battle and shows that the Earth is not the centre of the universe. Darwin fights the “Anthropocentrism” battle and shows that mankind is but an evolved ape and part of a larger picture of complexity evolving out of simplicity. Sampson revisits these controversies and demonstrates not only that history has been distorted, but also that the myth-perpetuators appear to be immune from correction.

The other modern myths addressed by Sampson reveal essentially the same points. In brief, they concern the environment (a story of mastery), the missionaries (a story of oppression), the human body (a story of repression) and witches (a story of persecution). A final chapter looks at the way postmodern scholars are looking afresh at the “modern” myths and recognising their inadequacies. Although these scholars have done useful work, they have made similar mistakes. They have retold the stories but given them a postmodern gloss.

The six case studies are well-researched and Sampson provides a perceptive analysis of the issues. Many students today appear to think that scholarship is objective and ultimately independent of the scholar – but Sampson shows that this is not the case. Scientists, historians and philosophers, for example, bring their personal agendas to their work. For this point alone, the book is worthy of being widely read.

Returning to Lord May’s “cultural terrorist” views, Sampson provides a robust rejoinder. Far from exemplifying open culture and honest questioning, the Enlightenment tradition is better suited to supply examples of hidden agendas, historical manipulation and prescribed answers. Close-minded fundamentalism is as likely to appear within Enlightenment scholarship as anywhere. After discussing some extreme examples, Sampson writes: “Disciples of this kind of fundamentalist rationalism insist that theirs is the only truth, and wish to prevent anyone from passing on alternative views, which they regard as irrational and obnoxious (p.154).”

So where can we find a role model for the values that we appear to hold in common with Lord May: rational, humane, questioning? Sampson reserves his punchline for the last paragraph. “The Bible recounts a truth-full narrative, and provides a basis for this in the Author’s revelation of himself and his actions in history. This revelation imbues our own story, and that of the world we know, with an eternal significance. This story, which is great with promise and warning, does not merely inform in the Enlightenment mode, nor entertain, in postmodern style, but demands that we engage with it. And ultimately, that we engage with its Author, in all our humanity (p.161)”. ▢

REFERENCE

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